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HRS DOCUMENTATION RECORD

for

James Barr Facility
Pearland, Texas

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July 2, 2002

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TNRCC

Protecting Texas by Reducing and Preventing Pollution

HAZARD RANKING SYSTEM DOCUMENTATION RECORD

for

James Barr Facility
Pearland, Brazoria County, Texas
SWR No. F0196
TXS FNO 605 176

Prepared by:

Texas Natural Resource Conservation Commission
Austin, Texas

July 2002

Hazard Ranking System

Documentation Record

James Barr Facility
Pearland, Brazoria County, Texas
TXS FNO 605 176
SWR No. F0196

Prepared by

Texas Natural Resource Conservation Commission
Site Assessment and Management Section
Superfund Site Discovery and Assessment Program Staff
Austin, Texas

July 2002

HRS DOCUMENTATION RECORD

JAMES BARR FACILITY

BRAZORIA COUNTY, TEXAS

SWR No. F0196
TXS FNO 605 176

SIGNATURE PAGE

_____ _____

John C. Syer Date
Texas Natural Resource Conservation Commission
Superfund Site Discovery and Assessment Program
Project Manager

_____ _____

Stephanie Pogue Date
Texas Natural Resource Conservation Commission
Superfund Site Discovery and Assessment Program
QA/QC Officer

_____ _____

Wesley Newberry Date
Texas Natural Resource Conservation Commission
Superfund Site Discovery and Assessment Program
Team Leader

_____ _____

David L. Davis Date
Texas Natural Resource Conservation Commission
Remediation Division
Assistant Division Director

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FIGURES

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HRS DOCUMENTATION RECORD - REVIEW COVER SHEET

SITE NAME: JAMES BARR FACILITY

CONTACT PERSON:

Documentation Record:John Syer - TNRCC Project Manager (512) 239-4136

PATHWAYS OF CONCERN:

Ground Water Pathway

The Ground Water Pathway is being scored based on potential contamination to area drinking water wells within the Chicot/Evangeline aquifer. The Chicot/Evangeline aquifer is the aquifer of concern.

Surface Water Pathway

An observed release of arsenic has been documented at the Probable Point of Entry (PPE), which lies in Cowart Creek. However, the Drinking Water Threat in the Surface Water Overland/Flood Migration Pathway was not evaluated due to the lack of drinking water targets within the 15 mile Target Distance Limit (TDL). The Human Food Chain Threat in the Surface Water Overland/Flood Migration Pathway is being scored based on potential contamination due to no Level I or II concentrations observed in fisheries along the TDL. The Environmental Threat in the Surface Water Overland/Flood Migration Pathway had no Level I or II concentrations observed within the TDL and the potential score did not significantly impact the overall pathway score. Therefore, the Environment Threat in the Surface Water Overland/Flood Migration Pathway was not evaluated.

PATHWAYS, COMPONENTS, OR THREATS NOT EVALUATED:

Soil Exposure Pathway

The Soil Exposure Pathway was not evaluated since the site is completely surrounded by a high-security, locked fence and due to the lack of targets within 200 feet of the soil contamination. Inclusion of this pathway would not significantly affect the site score.

Air Migration Pathway

The Air Migration Pathway was not evaluated due to the lack of an observed release and because the inclusion of this pathway would not significantly affect the site score.

(Although these pathways have not been evaluated, the TNRCC is concerned for all pathways surrounding the site. However, evaluation of these pathways would not have significantly increased the overall site score.)

NOTE TO THE READER

The following rules were used when citing references in this HRS Documentation Report:

1. If the reference cited had an original page number that number is cited.

2. If the reference cited had no original page number, then a designated tracking number is cited.

3. If the reference cited is for analytical data found within a table, the sample ID is used to locate that reference.

4. The State predecessor agencies: Texas Water Quality Board (TWQB), Texas Department of Water Resources (TDWR), Texas Water Commission (TWC), and Texas Air Control Board (TACB), referred to throughout this report are now known as the Texas Natural Resource Conservation Commission (TNRCC). The new agency, TNRCC, became effective September 1, 1993, as mandated under State Senate Bill 2 of the 73rd Regular Legislative Session.

HRS DOCUMENTATION RECORD

Name of Site: James Barr Facility **Date Prepared:** 07/02

Solid Waste Registration (SWR) Number:

Site Owner: James Barr III
734 International #12
Houston, TX 77024

Street Address of Site: 3300 Industrial Drive

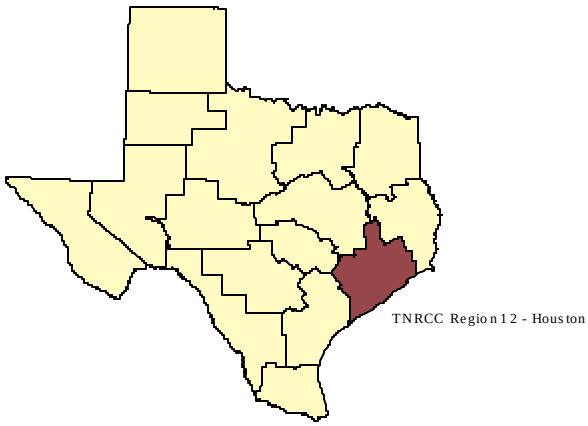
City, County, State: Pearland, Brazoria County, Texas

General Location in the State:
(see Figure 1, Site Location Map)

Topographic Map(s): U.S. Geological Survey 7.5 Minute Topographic Map, Pearland Quadrangle (Ref. 5)

Latitude: 29º 31' 48.43" North
Longitude: 95º 15' 41.85" West

TNRCC Region: 12



Pathway Scores:
Groundwater Migration Pathway - 27.39
Surface Water Migration Pathway - 42.67
Soil Exposure Pathway - NE
Air Migration Pathway - NE
(NE - Not Evaluated)

HRS SITE SCORE: 25.35

SITE SUMMARY

General Description of the Site:

The James Barr Facility (JBF) site is located in the 3300 block of Industrial Drive, in the southern part of the corporate boundary of the City of Pearland, Brazoria County, Texas (Figure 1). The site is located on a two (2) acre tract and is owned by James Barr (Ref. 11, pp. 1,2; Ref. 12, pp. 1-3, plat map). The site is bound on the north by undeveloped land, on the east by the Kneeland Construction Company and at least four sand pits filled with water, on the west by businesses along Industrial Drive, and to the south by industrial businesses, areas of sand mining and oil field production facilities (Ref. 6, p. 28).

Presently, the site consists of contaminated soil and two surface impoundments (Ref. 6, p. 5, Ref. 13, p. 1). The contaminated soil originated from a spill from a skid-mounted horizontal tank located at the site (Ref. 7, p. 6; Ref. 9, p. 2). Wash water generated from transport vehicles was reportedly stored in the two on-site surface impoundments. Both of the surface impoundments were observed containing slightly oily sheen and black liquid/sludge type wastes (Ref. 6, p. 1; Ref. 10, pp. 17, 19). During the SSI, conducted in May 1999, inorganic and organic hazardous substances were reported in sediment samples collected from the two surface impoundments (Ref. 4, pp. 18-24, 30-36). Additionally, there are three (3) unusable Above Ground Storage Tanks (ASTs) and the remains of two (2) additional ASTs on the James Barr Facility (Ref. 6, p. 5; Ref. 7, p. 10; Ref. 13, p. 1). All the wastes stored in the ASTs were removed during an Immediate Removal conducted in August 2001 (Ref. 13, p. 1).

Site History:

Mr. James Barr operated the JBF Site as a storage facility for hazardous waste transported in by vacuum trucks and unloaded into the various aboveground storage tanks located on the property. Additionally, wash water generated from the transport vehicles was reportedly stored in two on-site surface impoundments. The time span of the storage operation is unknown at the time. Mr. Barr reportedly went bankrupt sometime in the 1980's (Ref. 6, p. 3, 5; Ref. 7, p. 7).

On December 5, 1995, Brazoria County auctioned the property due to unpaid taxes (Ref. 8, p. 2). Ms. Janice Walker purchased the property from Brazoria County with the intent of erecting a building in which to store the inventory of her party supply business. Ms. Walker authorized Mr. Samuel Gage, a welder contractor, to cut open the aboveground storage tanks and salvage the steel. Mr. Gage apparently salvaged several aboveground tanks adjacent to Industrial Drive (Ref. 6, p. 3; Ref. 9, p. 2). On April 11, 1997, a spill of oily material onto the ground occurred while Mr. Gage began salvage operations on a skid-mounted horizontal tank (Ref. 7, p. 6; Ref. 9, p. 2). The spilled material was hazardous due to concentrations of benzene (3.09 mg/l) and 1,2-dichloroethane (6.71 mg/l) reported in samples collected from the spill site. In addition, the sample results also showed detectable levels of hazardous metals and several organic constituents (Ref. 7, p. 8, 20-27).

In July 1997, Ms. Walker hired a contractor to clean up the spilled material. The spilled material was put back into the horizontal tank and the tank secured. The contaminated soil was excavated and placed into 55-gallon metal drums on pallet support. Microbes were reportedly used during the cleanup actions for treating the contaminated soil. No confirmation samples were collected following remediation of the spill (Ref. 6, p. 3; Ref. 7, p. 9). However, the nineteen (19) 55-gallon drums containing the contaminated soil

from the April 1997 spill were left onsite. In August 2001, the nineteen (19) drums were removed from the property during an immediate removal action (Ref. 13, p. 1). On May 6, 1997, Ms. Walker and Mr. James Barr signed a notarized agreement concerning redemption of the property back to Mr. Barr (Ref. 8, p. 2).

Prominent site features at the JBF site are shown in Figure 2. The site contains one (1) skid mounted horizontal tank, three (3) unusable vertical tanks, two (2) surface impoundments, and the remains of two (2) additional vertical tanks (Ref. 6, p. 5; Ref. 7, p. 10; Ref. 13, p. 1). Two surface impoundments are also located at the JBF site. One surface impoundment (North Surface Impoundment) covers an area of approximately 2350 square feet, with a depth of approximately two (2) to three (3) feet. The second surface impoundment (South Surface Impoundment) covers an area of approximately 1250 square feet with an unknown depth. Wash water from the transport vehicles was reportedly stored in these surface impoundments. The material in the North Surface Impoundment is a brownish/black clear liquid with a slight oily sheen, whereas the material in the South Surface Impoundment appears as a blackish sludge with a definite oily sheen and hydrocarbon odor (Ref. 5, p. 1).

Screening Site Inspection:

During the week of May 24, 1999, the TNRCC Superfund Site Discovery and Assessment Team (SSDAT) conducted a U. S. Environmental Protection Agency (EPA) Screening Site Inspection (SSI) sampling event at JBF site. The primary objective of the sampling event was to document the release(s) or potential release(s) of hazardous substances from the site to the Chicot/Evangeline aquifer and surface waters downstream from the JBF site (Ref. 4). Source areas evaluated during the Screening Site Inspection (SSI) included onsite contaminated soils, and the two surface impoundments. Laboratory results from samples collected from source areas reported concentrations of inorganic and organic hazardous substances greater than three (3) times background levels (Ref. 4, pp. 11-13, 21-25, 33-36). The following hazardous susbstances were reported in samples collected from onsite sources at the JBF site.

TABLE 1

HAZARDOUS SUBSTANCES REPORTED ONSITE AT THE JBF SITE			
Hazardous Substance	**Media / Sample #**	**Highest Concentration Reported**	**References**
Aluminum	Soil / SO-03	16,100 mg/Kg	Ref. 4, p. 21
Arsenic	Sediment / SE-13	8.8 mg/Kg	Ref. 4, p. 21
Barium	Sediment / SE-14	11,300 mg/Kg	Ref. 4, p. 33
Cadmium	Sediment / SE-14	2.7 mg/Kg	Ref. 4, p. 33
Chromium	Sediment / SE-13	86.7 mg/Kg	Ref. 4, p. 33
Copper	Sediment / SE-14	91.3 mg/Kg	Ref. 4, p. 33
Lead	Sediment / SE-14	556 mg/Kg	Ref. 4, p. 33
Manganese	Sediment / SE-14	282 mg/Kg	Ref. 4, p. 33

TABLE 1 - Continued on the subsequent page ....

TABLE 1 - Continued

HAZARDOUS SUBSTANCE	Media / Sample #	Highest Concentration Reported	References
Mercury	Sediment / SE-13	0.49 mg/Kg	Ref. 4, p. 21
Nickel	Sediment / SE-13	23.6 mg/Kg	Ref. 4, p. 21
Potassium	Sediment / SE-14	1,850 mg/Kg	Ref. 4, p. 33
Vanadium	Soil / SO-03	25.1 mg/Kg	Ref. 4, p. 21
Zinc	Sediment / SE-14	452 mg/Kg	Ref. 4, p. 34
2-Butanone	Soil / SO-03	16 ug/Kg	Ref. 4, p. 22
Benzene	Sediment / SE-13	17 ug/Kg	Ref. 4, p. 22
2-Hexanone	Sediment / SE-13	19 ug/Kg	Ref. 4, p. 22
Toluene	Sediement / SE-13	93 ug/Kg	Ref. 4, p. 22
Ethylbenzene	Sediment / SE-13	71 ug/Kg	Ref.4, p. 22
Styrene	Sediment / SE-13	15 ug/Kg	Ref. 4, p. 22
Xylene (total)	Sediment / SE-13	110 ug/Kg	Ref. 4, p. 22
Napthalene	Sediment / SE-14	820 ug/Kg	Ref. 4, p. 34
2-Methylnapthalene	Sediment / SE-14	850 ug/Kg	Ref. 4, p. 34
Dibenzofuran	Sediement / SE-14	790 ug/Kg	Ref. 4, p. 34
Fluorene	Sediment / SE-14	2,200 ug/Kg	Ref. 4, p. 34
Phenanthrene	Sediment / SE-14	3,900 ug/Kg	Ref.4, p. 34
Anthracene	Sediment / SE-14	28,000 ug/Kg	Ref. 4, p. 34
Carbazole	Sediment / SE-14	11,000 ug/Kg	Ref. 4, p. 34
Fluoranthene	Soil / SO-02	5,900 ug/Kg	Ref. 4, p. 11
Pyrene	Soil / SO-02	12,000 ug/Kg	Ref. 4, p. 11
Butylbenzylphthalate	Soil / SO-02	4,000 ug/Kg	Ref. 4, p. 11
Benzo(a)anthracene	Soil / SO-03	1,400 ug/Kg	Re. 4, p. 23
Benzo(b)fluoranthene	Sediment / SE-13	2,700 ug/Kg	Ref. 4, p. 23
Benzo(k)fluoranthene	Soil / SO-03	970 ug/Kg	Ref. 4, p.24
Benzo(a)pyrene	Soil / SO-03	740 ug/Kg	Ref. 4, p. 24
Chrysene	Soil / SO-02	4,500 ug/Kg	Ref. 4, p. 11
bis (2-Ethylhexyl) phthalate	Soil / SO-02	3,800 ug/Kg	Ref. 4, p. 12

TABLE 1 - Continued on the subsequent page ....

TABLE 1 - Continued

Hazardous Substance	Media / Sample #	Highest Concentration Reported	References
Indeno(1,2,3-cd) pyrene	Sediment / SE-14	860 ug/Kg	Ref. 4, p. 35
Benzo(g,h,i) perylene	Sediment / SE-14	1,100 ug/Kg	Ref. 4, p. 35
Aldrin	Sediment / SE-13	2.9 ug/Kg	Ref. 4, p. 24
Methoxychlor	Sediment / SE-14	28 ug/Kg	Ref. 4, p. 35
Dieldrin	Soil / SO-03	12 ug/Kg	Ref. 4, p. 24
Endosulfan II	Soil / SO-03	8.2 ug/Kg	Ref. 4, p. 24
4,4' - DDD	Soil / SO-03	16 ug/Kg	Ref. 4, p. 24
Endrin Ketone	Sediment / SE-13	38 ug/Kg	Ref. 4, p. 24
Endin Aldehyde	Soil / SO-03	9.1 ug/Kg	Ref. 4, p. 24
alpha-Chlordane	Sediment / SE-14	28 ug/Kg	Ref. 4, p. 35
gamma-Chlordane	Soil / SO-03	36 ug/Kg	Ref. 4, p. 24
beta-BHC	Soil / SO-02	27 ug/Kg	Ref. 4, p. 12
Endrin	Soil / SO-02	27 ug/Kg	Ref. 4, p. 12
Endosulfan Sulfate	Soil / SO-02	40 ug/Kg	Ref. 4, p. 12

- ***Ground Water Pathway***

Groundwater samples were collected from municipal and private wells to evaluated whether hazardous substances from the sources at the JBF site had impacted the Chicot/Evangeline aquifer. After analysis of the ground water samples, concentrations of zinc were reported significantly above background levels in ground water samples collected from municipal and private wells (Ref. 4, pp. 45-52). Based on the analytical data, the SSI reported an observed release of zinc to the Chicot/Evangeline aquifer; however, there is no evidence of attribution (Ref. 4, p. 45; Ref. 1, Sec. 3.1.1, Chemical Analysis). Therefore, the Ground Water Pathway is being scored based on potential contamination to area drinking water wells within the Chicot/Evangeline aquifers. The Chicot/Evangeline aquifer is the aquifer of concern.

Likelihood of Release to the Chicot/Evangeline - Potential to Release

The Potential to Release is evauated based on four factors: Containment, Net Precipitation, Depth to Aquifer, and Travel Time (Ref. 1, Sec. 3.1.2). The containment factor for all three sources was evaluated in the SSI report to be (10) ten (Ref. 4, pp. 7, 8, 19, 31). The net precipitation factor value was determined by using Figure 2-3 in the HRS and the locale of the JBF site. The net precipitation factor was determined to be (3) three (Ref. 1, Sec. 3.1.2.2, Figure 3-2).

According to the HRS, the depth to aquifer is evaluated by determining the depth from the lowest point of hazardous substances at a site to the top of the aquifer being evaluated, considering all layers in that interval (Ref. 1, Sec. 3.1.2.3). The SSI report revealed the presence of hazardous substances within the first (6) six inches of soil and the first (2) two feet of sediment (Ref. 4, pp. 6-40). Based on this information, the depth of hazardous susbstance was determined as ground level or sea level (Ref. 1, Sec. 3.1.2.3). The depth to the top of the Chicot/Evangeline aquifer was ascertained by researching the geology in the vicinity of the JBF site and reviewing the well logs within a half-mile radius. The Chicot/Evangeline aquifer was reported to be composed of the upper and lower unit of the Chicot aquifer and the Evangeline aquifer. For HRS scoring purposes, these strata were combined into a single hydrologic unit due to interconnections between each aquifer (Ref. 4, pp. 42-44, Ref. 16, pp. 19-20, 47-48). Therefore, the top of the Chicot/Evangeline aquifer was composed of the upper unit of the Chicot aquifer. The upper unit of the Chicot Aquifer was reported to be present between the surface and a depth ranging from about 100 to 300 feet (Ref. 4, p. 42). However, using the well logs within a half-mile radius of the JBF site, the average depth to the upper unit of the Chicot aquifer was calculated to be approximately (45) forty-five feet below sea level. According to the HRS, Section 3.1.2.3, Depth to Aquifer, if the necessary geologic information is available at multiple locations (well logs) calculate the depth to aquifer at each location and use the smallest depth to assign the factor value. The depth to the upper unit of the Chicot aquifer was less than 25 feet in several wells within a half-mile radius (Ref. 15, p. 1). The smallest depth to the upper unit of Chicot aquifer was observed to be (9) feet, Well No. 65-30-9B, Quinten Jamison. Based on this data, the Depth to Aquifer factor value was determine as (5) five (Ref. 1, Sec 3.1.2.3, Table 3-5).

Finally, the fourth factor, Travel Time is based on the geologic materials in the interval between the lowest known point of hazardous substances at the site and the top of the aquifer being evaluated.
According the the HRS, Section 3.1.2.4, Travel Time, if the depth to aquifer (HRS Section 3.1.2.3) is 10 feet or less, assign a value of (35) thirty-five. The depth to aquifer was determine in the previous paragraph as (9) feet; therefore, a value of (35) was assigned to Travel Time (Ref. 15; Ref. 1, Section 3.1.2.3, Section 3.1.2.4).

Waste Characteristics - Potential to Release

The SSI report based the waste characteristics on the observed release of zinc. This HRS documentation record is based on a potential release of hazardous substances from sources (1) one, contaminated soils, (2) two, south surface impoundment, and (3) three, north surface impoundment. Therefore, the waste characteristics are based on the toxicity / mobility of the hazadous substances associated with the sources and the hazardous waste quantity (Ref. 1, Section 3.2). The hazardous waste quantity factor value for the ground water pathway was determined in the SSI report to be (100) one-hundred (Ref. 1, Section 2.4.2; Ref. 4, p. 54). The toxicity / mobility factor values for the sources are given below in the following section.

The following Toxicity and Mobility Factor Values have been assigned to those substances associated with Source No. 1, No.3, and No. 3, which have a ground water containment factor greater than zero (0). These factor values are summarized in Table 2 (Ref. 1, Sec. 3.2.1.3; Ref 2, pp. B-1-B-20; Ref. 4, pp. 10-13, 21-24, 33-35).

TABLE 2

Toxicity/Mobility Factor Values Ground Water Pathway					
Hazardous Substance	**Source No. Documented**	**Toxicity Factor Value**	***Mobility Factor Value**	**Toxicity / Mobility**	**Reference**
Aluminum	1, 2	....	0.0001	....	Ref. 4, p. 10-13, 21-24; Ref. 3, p. B-1
Arsenic	1, 2, 3	10,000	0.01	**100**	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-2
Barium	1, 2, 3	10,000	0.01	**100**	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-2
Cadmium	2, 3	10,000	0.01	**100**	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-4
Chromium	1, 2, 3	10,000	0.01	**100**	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-5
Copper	1, 2, 3	.....	0.01	....	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-6
Lead	1, 2, 3	10,000	0.01	**100**	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-13
Manganese	1, 2, 3	10,000	0.01	**100**	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-13
Mercury	2, 3	10,000	0.01	**100**	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-13
Nickel	1, 2, 3	10,000	0.01	**100**	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-14
Potassium	1, 2, 3	....	1	....	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-17
Vanadium	1, 2, 3	100	0.01	1	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-20
Zinc	1, 2, 3	10	1	10	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-20
Anthracene	2, 3	10	0.01	0.1	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-2
Benzo(a)anthracene	2	1,000	0.01	10	Ref. 4, p. 21-24; Ref. 3, p. B-2
Benzo(b)fluoranthene	2, 3	1,000	0.0001	0.1	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-3
Benzo(k)fluoranthene	2	100	0.0001	0.01	Ref. 4, p. 21-24; Ref. 3, p. B-3
TABLE 2 - Continued on the subsequent page					

TABLE 2 - Continued

Toxicity/Mobility Factor Values Ground Water Pathway					
Hazardous Substance	**Source No. Documented**	**Toxicity Factor Value**	***Mobility Factor Value**	**Toxicity / Mobility**	**Reference**
Benzo(a)pyrene	2	10,000	0.0001	1	Ref. 4, p. 21-24; Ref. 3, p. B-2
Benzo(g,h,i)perylene	3	....	0.0001	....	Ref. 4, p. 33-35; Ref. 3, p. B-3
bis (2-Ethylhexyl) phthalate	1, 2	100	0.0001	0.01	Ref. 4, p. 10-13, 21-24; Ref. 3, p. B-3
Butylbenzyl phthalate	1, 2	10	0.01	0.1	Ref. 4, p. 10-13, 21-24; Ref. 3, p. B-4
Carbazole	2, 3	10	1	10	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-4
Chrysene	1, 3	10	0.01	0.1	Ref. 4, p. 10-13, 33-35; Ref. 3, p. B-5
Dibenzofuran	3	....	0.01	....	Ref. 4, p. 33-35; Ref. 3, p. B-7
Fluoranthene	1, 2, 3	100	0.01	1	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-10
Fluorene	2, 3	100	0.01	1	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-10
2-Methylnapthalene	3	....	0.01	....	Ref. 4, p. 33-35; Ref. 3, p. B-14
Napthalene	3	100	1	**100**	Ref. 4, p. 33-35; Ref. 3, p. B-14
Phenanthrene	3	....	0.01	0	Ref. 4, p. 33-35; Ref. 3, p. B-16
Pyrene	1, 2, 3	100	0.01	1	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-17
Endrin	1	10,000	0.01	**100**	Ref. 4, p. 10-13; Ref. 3, p. B-10
Endosulfan Sulfate	1	100	1	**100**	Ref. 4, p. 10-13; Ref. 3, p. B-9
Aldrin	2	10,000	0.0001	1	Ref. 4, p. 21-24; Ref. 3, p. B-1
TABLE 2 - Continued on the subsequent page					

TABLE 2 - Continued

Toxicity/Mobility Factor Values Ground Water Pathway					
Hazardous Substance	**Source No. Documented**	**Toxicity Factor Value**	***Mobility Factor Value**	**Toxicity / Mobility**	**Reference**
Dieldrin	2	10,000	0.01	**100**	Ref. 4, p. 21-24; Ref. 3, p. B-8
Endosulfan II	2	100	1	**100**	Ref. 4, p. 21-24; Ref. 3, p. B-9
4,4'-DDD	2	100	0.0001	0.01	Ref. 4, p. 21-24; Ref. 3, p. B-6
alpha-Chlordane	3	10	0.01	0.1	Ref. 4, p. 33-35; Ref. 3, p. B-4
Methoxychlor	3	100	0.01	1	Ref. 4, p. 33-35; Ref. 3, p. B-13
Endrin Ketone	2	100	....	....	Ref. 4, p. 21-24; Ref. 3, p. B-10
Endrin Aldehyde	2	....	0.01	....	Ref. 4, p. 21-24; Ref. 3, p. B-10
gamma-Chlordane	1,2	10	0.01	0.1	Ref. 4, p. 10-13, 21-24; Ref. 3, p. B-4
2-Butanone	2	10	1	10	Ref. 4, p. 21-24; Ref. 3, p. B-13
Benzene	2	100	1	**100**	Ref. 4, p. 21-24; Ref. 3, p. B-2
2-Hexanone	2	1	1	1	Ref. 4, p. 21-24; Ref. 3, p. B-12
Toluene	2	10	1	10	Ref. 4, p. 21-24; Ref. 3, p. B-19
Ethylbenzene	2	10	1	10	Ref. 4, p. 21-24; Ref. 3, p. B-10
Styrene	2	10	1	10	Ref. 4, p. 21-24; Ref. 3, p. B-18
Xylene	2	10	1	10	Ref. 4, p. 21-24; Ref. 3, p. B-20

Notes: **Bold** = indicates the highest toxicity/mobility factor value.

A review of Table 2 reveals the hazardous substances Arsenic, Barium, Cadmium, Chromium, Lead, Manganese, Mercury, Nickel, Napthalene, Endrin, Endosulfan Sulfate, Dieldrin, Endosulfan II, and Benzene are the substances with the highest Toxicity / Mobility Factor Value of (100) one-hundred. A Toxicity / Mobility Factor Value of (100) one-hundred will be enter into Table 3-1 of the HRS on page 19 of this documentation record (Ref. 1, Sec. 3.2.1.3).

- *Surface Water Pathway*

Sediment samples were collected from the closest perennial surface water body downstream from the site to assess the Surface Water Migration Pathway during the May 1999 SSI sampling event. These samples were collected from ditches that drain the surrounding area and Cowart Creek (Ref. 4, pp. 69-73). An observed release attributable to the sources at JBF was reported in sediment sample SE-09, which was collected at the Probable Point of Entry (PPE) (Ref. 4, pp. 72, 73). Concentrations of arsenic (19 mg/Kg) and manganese (2,050 mg/Kg) were reported above three times background levels in sediment sample SE-09 (Ref. 4, pp. 72, 73).

TABLE 3

Contaminated Sediment Sample Collected from Cowart Creek at the PPE				
Sample ID	**Sample Location**	**Sample Depth**	**Date Collected**	**Location Reference**
SE-09	Confluence of Drainage Ditch and Cowart Creek at the PPE	Grab Sample / 0"- 6"	05/25/99	Ref. 4, Figure 6; Appendix A, Photograph 19
Sample ID	**Hazardous Substance**	**Concentration**	**Reference**	
SE-09	Arsenic	19 mg/Kg	Ref. 4, p. 72	
	Manganese	2050 mg/Kg	Ref. 4, p. 72	

The Drinking Water Threat in the Surface Water Overland/Flood Migration Pathway was not evaluated due to the lack of drinking water targets within the 15 mile Target Distance Limit (TDL) (Ref. 4, p. 69). The Human Food Chain Threat in the Surface Water Overland/Flood Migration Pathway is being scored based on potential contamination due to no Level I or II concentrations observed in fisheries along the TDL (Ref. 4, pp.74-79). The Environmental Threat in the Surface Water Overland/Flood Migration Pathway had no Level I or II concentrations observed within the TDL and the potential score did not significantly impact the overall pathway score (Ref. 4, pp. 80-84). Therefore, the Environment Threat in the Surface Water Overland/Flood Migration Pathway was not evaluated.

In the SSI report the Human Food Chain Threat of the Surface Water Pathway score was based on the observed release of manganese and arsenic at the PPE. The Toxicity / Persistence / Bioaccumulation Factor Value was evaluated using only release constiuents and was determined to be as (5.0×10^6) five million. In this HRS documentation record, the Toxicity / Persistence / Bioaccumulation Factor Value is determined by evaluating all hazardous substance associated with all sources that have an surface water containment factor greater than (0) zero (Ref. 1, Sec. 4.1.3.2). The Toxicity / Persistence / Bioaccumulation Factor Values for each hazardous substance are given below in the following section.

The following Toxicity / Persistence / Bioaccumulation Factor Values have been assigned to those substances associated with Source No. 1, No.3, and No. 3, which have a surface water containment factor greater than zero (0). These factor values are summarized in Table 4 (Ref. 1, Sec. 4.1.3.2.1; Ref 2, pp. B-1-B-20; Ref. 4, pp. 10-13, 21-24, 33-35).

TABLE 4

Toxicity / Persistence/ Bioaccumulation Factor Values Surface Water Pathway						
Hazardous Substance	**Source No. Doc.**	**Tox. Factor Value**	***Pers. Factor Value**	**Bioaccum. Factor Value**	**Tox /Pers./ Bioaccum.**	**References**
Aluminum	1, 2	....	0.0001	50	....	Ref. 4, p. 10-13, 21-24; Ref. 3, p. B-1
Arsenic	1, 2, 3	10,000	1.00	500	5.00e+06	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-2
Barium	1, 2, 3	10,000	1.00	0.5	5.00e+03	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-2
Cadmium	2, 3	10,000	1.00	5000	5.00e+07	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-4
Chromium	1, 2, 3	10,000	1.00	500	5.00e+06	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-5
Copper	1, 2, 3	.....	0.01	50000	....	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-6
Lead	1, 2, 3	10,000	1.00	5000	5.00e+07	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-13
Manganese	1, 2, 3	10,000	1.00	0.5	5.00e+03	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-13
Mercury	2, 3	10,000	0.400	50000	2.00e+08	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-13
Nickel	1, 2, 3	10,000	1.00	500	5.00e+06	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-14
Potassium	1, 2, 3	....	1	0.5	....	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-17
Vanadium	1, 2, 3	100	1.00	0.5	5.00e+01	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-20
Zinc	1, 2, 3	10	1	50000	5.00e+05	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-20
Anthracene	2, 3	10	1.00	5000	5.00e+04	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-2
Benzo(a)anthracene	2	1,000	1.00	50000	5.00e+07	Ref. 4, p. 21-24; Ref. 3, p. B-2
Benzo(b)fluoranthene	2, 3	1,000	1.0	50000	5.00e+07	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-3
Benzo(k)fluoranthene	2	100	1.0	50000	5.00e+06	Ref. 4, p. 21-24; Ref. 3, p. B-3

TABLE 4 - Continued on the subsequent page ....

TABLE 4 - Continued

Toxicity / Persistence/ Bioaccumulation Factor Values Surface Water Pathway						
Hazardous Substance	**Source No. Doc.**	**Tox. Factor Value**	***Pers. Factor Value**	**Bioaccum. Factor Value**	**Tox /Pers./ Bioaccum.**	**References**
Benzo(a)pyrene	2	10,000	1.0	50000	**5.00e+08**	Ref. 4, p. 21-24; Ref. 3, p. B-2
Benzo(g,h,i)perylene	3	....	1.0	50000	....	Ref. 4, p. 33-35; Ref. 3, p. B-3
bis (2-Ethylhexyl) phthalate	1, 2	100	1.0	50000	5.00e+06	Ref. 4, p. 10-13, 21-24; Ref. 3, p. B-3
Butylbenzylphthalate	1, 2	10	1.0	500	5.00e+03	Ref. 4, p. 10-13, 21-24; Ref. 3, p. B-4
Carbazole	2, 3	10	0.4	500	2.00e+03	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-4
Chrysene	1, 3	10	1.0	500	5.00e+03	Ref. 4, p. 10-13, 33-35; Ref. 3, p. B-5
Dibenzofuran	3	....	1.0	500	....	Ref. 4, p. 33-35; Ref. 3, p. B-7
Fluoranthene	1, 2, 3	100	1.0	5000	5.00e+05	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-10
Fluorene	2, 3	100	1.0	5000	5.00e+05	Ref. 4, p. 21-24, 33-35; Ref. 3, p. B-10
Indeno(1,2,3-cd) pyrene	3	1,000	1.0	50000	5.00e+07	Ref. 4, p. 33-35; Ref. 3, p. B-12
2-Methylnapthalene	3	....	0.4	5000	....	Ref. 4, p. 33-35; Ref. 3, p. B-14
Napthalene	3	100	0.4	500	2.00e+04	Ref. 4, p. 33-35; Ref. 3, p. B-14
Phenanthrene	3	....	1.0	50	....	Ref. 4, p. 33-35; Ref. 3, p. B-16
Pyrene	1, 2, 3	100	1.0	5000	5.00e+05	Ref. 4, p. 10-13, 21-24, 33-35; Ref. 3, p. B-17
Endrin	1	10,000	1.0	5000	5.00e+07	Ref. 4, p. 10-13; Ref. 3, p. B-10
Endosulfan Sulfate	1	100	1	500	5.00e+04	Ref. 4, p. 10-13; Ref. 3, p. B-9
Aldrin	2	10,000	1.0	50000	**5.00e+08**	Ref. 4, p. 21-24; Ref. 3, p. B-1

TABLE 4 - Continued on the subsequent page ....

TABLE 4 - Continued

Toxicity / Persistence/ Bioaccumulation Factor Values Surface Water Pathway						
Hazardous Substance	**Source No. Doc.**	**Tox. Factor Value**	***Pers. Factor Value**	**Bioaccum. Factor Value**	**Tox /Pers./ Bioaccum.**	**References**
Dieldrin	2	10,000	1.0	50000	**5.00e+08**	Ref. 4, p. 21-24; Ref. 3, p. B-8
Endosulfan II	2	100	1.0	5000	5.00e+05	Ref. 4, p. 21-24; Ref. 3, p. B-9
4,4'-DDD	2	100	1.0	50000	5.00e+06	Ref. 4, p. 21-24; Ref. 3, p. B-6
alpha-Chlordane	3	10	1.0	500	5.00e+03	Ref. 4, p. 33-35; Ref. 3, p. B-4
Methoxychlor	3	100	1.0	50000	5.00e+06	Ref. 4, p. 33-35; Ref. 3, p. B-13
Endrin Ketone	2	100	0.4	0.5	2.00e+01	Ref. 4, p. 21-24; Ref. 3, p. B-10
Endrin Aldehyde	2	....	0.4	500	....	Ref. 4, p. 21-24; Ref. 3, p. B-10
gamma-Chlordane	1, 2	10	1.0	50000	5.00e+05	Ref. 4, p. 10-13, 21-24; Ref. 3, p. B-4
2-Butanone	2	10	0.4	0.5	2.00e+00	Ref. 4, p. 21-24; Ref. 3, p. B-13
Benzene	2	100	0.4	5000	2.00e+05	Ref. 4, p. 21-24; Ref. 3, p. B-2
2-Hexanone	2	1	0.4	5	2.00e+00	Ref. 4, p. 21-24; Ref. 3, p. B-12
Toluene	2	10	0.4	50	2.00e+02	Ref. 4, p. 21-24; Ref. 3, p. B-19
Ethylbenzene	2	10	0.4	50	2.00e+02	Ref. 4, p. 21-24; Ref. 3, p. B-10
Styrene	2	10	0.4	50	2.00e+02	Ref. 4, p. 21-24; Ref. 3, p. B-18
Xylene	2	10	0.4	500	2.00e+03	Ref. 4, p. 21-24; Ref. 3, p. B-20

Notes: **Bold** = indicates the highest toxicity/persistence/bioaccumulation factor value.

A review of Table 3 reveals the hazardous substances Benzo(a) Pyrene, Aldrin, and Dieldrin are the substances with the highest Toxicity / Persistence / Bioaccumulation Factor Value of (5.0×10^8) five-hundred million. A Toxicity / Persistence / Bioaccumualtion Factor Value of (5.0×10^8) five-hundred million will be enter into Table 3-1 of the HRS on page 19 of this documentation record (Ref. 1, Sec. 3.2.1.3).

Using USGS Surface Water Data Stations (ID No. 08077540 and 08077000) along Clear Creek, the dilution weight for In-Segment 3 (Clear Creek Tidal) was estimated by using extrapolation (Ref. 2, pp. 231-238; Ref. 17, Ref. 18). The flow estimate measured in cubic feet per second (cfs) was determine by the following series of steps (Ref. 2, pp. 235-237):

(1) Identify two gauging stations - USGS Station No. 08077540 (A) and 08077000 (B), both upstream of the target fishery located in the In-Water Segment 3 (Clear Creek Tidal, approx. 9.2 miles).

Station No. 08077540 - Q_A = 36.98 cfs (Ref. 17; Ref. 5; Ref. 19; Ref. 20)
Station No. 08077000 - Q_B = 238.32 cfs (Ref. 18; Ref. 5; Ref. 19; Ref. 20)

(2) Using HRS Table 4-13, determine the assigned dilution weight for each guaging station.

Station No. 08077450 = 0.1
Station No. 08077000 = 0.01

(3) Perform Linear Extrapolation (Ref 2, pp. 235-237; Ref. 5; Ref. 19; Ref. 20)

- Detemine the incremental discharge.
  Q_I = 238.32 cfs - 36.98 cfs = 201.34 cfs

- Calculate a change in discharge per unit length.
  Q_X = 201.34 cfs / 13.57 miles (distance between stations) = 14.83 cfs/mile

- Calculate the estimated discharge at the target.
  Q_S (est.) = Start of In-Water Segment 3 (Ref. 4, p. 68)
  Q_S (est.) = 238.32 cfs + (14.83 cfs/mile ***x*** 3.40 miles) = 288.74 cfs (Start)

  Q_E (est.) = End of In-Water Segment 3 (Ref. 4, p. 68)
  Q_E (est.) = 238.32 cfs + (14.83 cfs/mile ***x*** 12.40 miles) = 422.21 cfs (End)

Using the above flow estimates for HRS In-Water Segment 3 and HRS Table 4-13, the surface water dilution weight assigned to the fishery in Clear Creek Tidal is 0.01 (Ref. 1, Sec. 4.1.2.3.1). The dilution weight of 0.01 for the fishery in HRS In-Water Segment 3 was used to determine the potential human food chain contamination for the Surface Water Pathway (Ref. 1, Sec. 4.1.3.3.2.3).

Immediate Removal:

In August 2001, an immediate removal was completed at the James Barr Facility by a TNRCC contractor. During the removal, all sludge and liquids were removed from the horizontal and vertical tanks. Additionally, nineteen (19) 55-gallon drums containing the contaminated soil from the April 1997 spill were removed from the property. No additional contaminated soil was removed from the James Barr Facility (Ref. 13, pp. 1-7).

Enforcement:

The site was identified to the TNRCC on April 11, 1997, because of a complaint to the City of Pearland's Fire Marshal to investigate possible hazardous substances leaking from a 20,000 gallon skid mounted aboveground storage tank. The TNRCC Houston Regional Office investigators inspected the property on July 1, 1997 (Complaint # 129700466) (Ref. 7, pp. 1,2). The investigators confirmed the release and collected samples of the unknown oily substance. Analytical results of the samples revealed high concentrations of benzene (3.09 mg/l) and dichloroethane (6.71 mg/l). On July 30, 1997, a limited cleanup was conducted by a local excavation crew that Mrs. Janice Walker hired. At this time, Mrs. Janice Walker owned this facility. Discolored soil was put in 55 gallons, pools of liquid were put back into the storage tank and Microbes were introduced into the area. No investigation or waste characterization was conducted. The excavated material was left on-site in the 55-gallon containers (Ref. 14, p. 1)

After the initial inspection conducted with the City of Pearland's Fire Marshal, a follow-up inspection was conducted on September 9, 1997, and Notice of Violation (NOV) was sent to Mrs. Janice Walker and Mr. James Barr III. On August 21, 1998, an Executive Directors Preliminary Report and Petition (EDPRP) was mailed to Janice Walker and James Barr III and was approved by the commission on June 8, 1999. The Order was seeking penalties and remediation of the property. On August 17, 1999, a NOV of Commission Order was sent to Mrs. Walker and Mr. Barr concerning payment of administrative penalties and remediation of the property. The NOV sent to James Barr was returned as no such address and Mrs. Walker's was unclaimed (Ref. 14, p. 2)

On December 21, 1999, the Office of the Attorney General (OAG) was requested by the TNRCC to enforce the Commission's Order. The OAG requested that Janice Walker be removed from the action because James Barr was the responsible party. After exhausting all methods of locating Mr. James Barr III by the OAG, the OAG filed a Notice of Non-Suit on April 6, 2001 (Ref. 14, p. 2)

On April 4, 2001 staff of the Enforcement Division and the Litigation Division reviewed potential remediation actions in relation to the James Barr property. A determination was made that all enforcement actions have been exhausted and that the property should be referred to the Remediation Division for appropriate resolution (Ref. 14, p. 1)

REFERENCES

Reference Number	Description of the Reference
1.	U.S. Environmental Protection Agency. Federal Register - 40 CFR Part 300; Hazard Ranking System; Final Rule, Volume 55, No. 241, December 14, 1990. 135 pages.
4.	U.S. Environmental Protection Agency. Hazard Ranking System Guidance Manual, EPA 540-R-92-026, OSWER Directive 9345.1-07, November 1992. 431 pages plus Appendix.
5.	U.S. Environmental Protection Agency. 1996 Superfund Chemical Data Matrix (SCDM). June 1993.
6.	U.S. Environmental Protection Agency,*Screening Site Inspection Report - James Barr Facility Site*, Pearland, Brazoria County, Texas. November 1999. 85 pages.
5.	U. S. Geological Survey, Pearland Quadrangle, Texas, 7.5 Minute Series. Topographic Map. 1995. (Map notations added by TNRCC). 1 page. (Figure 1).
6.	U.S. Environmental Protection Agency. Pre-CERCLIS Screening Checklist for James Barr Facility Site, Pearland, Brazoria County, Texas. CERCLIS #TXSFN0605176, March 24, 1999. 5 pages plus Attachments. (Appendix A, narrative only)
7.	Texas Natural Resource Conservation Commission. TNRCC Complaint Printout, Complaint No. 129700466. March 10,1998. 2 pages with attached Complaint Report.
8.	Parker, Richard, Richard Parker & Associates, to The Honorable Larry Steed, Fire Marshall, City of Pearland. Letter. June 12, 1997. 1 page with attached Notarized Agreement.
9.	Steed, Larry, Fire Marshall, City of Pearland, to Aron Athavaley, TNRCC. Facsimile Message. 5/21/97. 8 pages.
10.	Kennedy, Johnny W., Site Investigation Manager, Texas Natural Resource Conservation Commission. Screening Site Inspection Field Logbook. James Barr Facility Site, Pearland, Brazoria County, Texas. CERCLIS No. TXS FNO605176. May 25 and 26, 1999.

REFERENCES - CONTINUED

11. Brazoria CAD Property Information, A0551 H T & B R R, Tract 164L, Owner's Name James Michael Barr III, 2 acres, Brazoria PID Number: R178222, Account Number: 0551-0010-210, Pearland, Brazoria County, Texas, 2 pages, http://www.brazoriacad.org/BrazoriaDetail.cfm.

12. The State of Texas, Brazoria County, *24379 Correction Warranty Deed with Vendor's Lien*, Tract 164L, July 18, 1983,Grantee: James Michael Barr III, Grantors: Wayne Miller and Charles Terry Gray, Notary Public: Kathryn S. Fralick, 3 pages and plat map.

13 Separation Systems Consultants, Inc.(SSCi), *Submittal of Deliverable for James Barr Facility, Pearland*, Texas, Work Order 582-9-1482, submitted to: Marshall Cedilote, Texas Natural Resource Conservation Commission., October 2, 2001, excerpt: 7 pages.

14. Texas Natural Resource Conservation Commission, Interoffice Memorandum, Subject: Property of James Barr III located at 3300 Industrial Boulevard, Pearland, TX 77851; To: Wesley Newberry, Team Leader, SSDAT; From David Van Soest, Enforcement Coordinator; Date: April 23, 2001, 2 pages.

15. Texas Natural Resource Conservation Commission, Water Well Data within ½ mile radius of the James Barr Site, created by John Syer, Superfund Site Discovery and Assessment Team (SSDAT), Date : May 22, 2002, 1 page.

16. Texas Department of Water Resources. Digital Models for Simulation of Ground-Water Hydrology of the Chicot and Evangeline Aquifers Along the Gulf Coast of Texas. Report 289. May 1985. Excerpt: page 10,11 (Figure 4), 19-20, 45-48.

17. United States Geological Survey (USGS), Water Resources, Gaging Station Data, USGS Station I.D. # 08077540, Clear Creek at Friendswood, TX, 4 pages.

18. United States Geological Survey (USGS), Water Resources, Gaging Station Data, USGS Station I.D. # 08077000, Clear Creek at Pearland, TX, 3 pages.

19. U. S. Geological Survey, Friendswood Quadrangle, Texas, 7.5 Minute Series. Topographic Map. 1982. (Map notations added by TNRCC). 1 page.

20. U. S. Geological Survey, League City Quadrangle, Texas, 7.5 Minute Series. Topographic Map. 1995. (Map notations added by TNRCC). 1 page.

21. U. S. Geological Survey, Algoa Quadrangle, Texas, 7.5 Minute Series. Topographic Map. 1956. (Map notations added by TNRCC). 1 page.

WORKSHEET FOR COMPUTING HRS SITE SCORE

			S	S^2
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)		27.39	750.21
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	42.67	1820.73	
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	NE		
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.		42.67	1820.73
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)		NE	
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)		NE	
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		2570.94	
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root		**25.35**	

GROUND WATER MIGRATION PATHWAY SCORESHEET

Chicot/Evangeline Aquifer

Factor Categories and Factors			Maximum Value	Value Assigned	
Likelihood of Release to an Aquifer					
1.	Observed Release		550	0	
2.	Potential to Release				
	2a.	Containment *(Ref. 1, Sec. 3.1.2.1; Ref. 4, pp. 8, 19, 31; Ref. 2, pp. B-1 - B-20)*	10	10	
	2b.	Net Precipitation *(Ref. 1, Sec. 3.1.2.1, Figure 3-2)*	10	3	
	2c.	Depth to Aquifer *(Ref. 1, Sec. 3.1.2.1, Ref. 4, pp. 13, 25, 36, 42; Ref. 15; Ref. 16, pp. 10,11, 19-20, 47-48)*	5	5	
	2d.	Travel Time *(Ref. 1, Sec. 3.1.2.1, Ref. 4, pp. 42-44, Ref. 15)*	35	35	
	2e.	Potential to Release *(Ref. 4, pp. 45-51)*			
		(Lines 2a(2b + 2c + 2d))	500	430	
3.	Likelihood of Release				
	(Higher of Line 1 and 2e)		550		**430**
Waste Characteristics					
4.	Toxicity/Mobility *(Ref. 1, Sec. 3.2.1; Ref. 4, pp. 10-13, 21-25, 33-36)*		*	100	
5.	Hazardous Waste Quantity *(Ref. 4, p.54, Table 9; Ref. 1, Sec. 2.4.2.2, Table 2-6)*		*	100	
6.	Waste Characteristics *(Ref. 4, p. 54, Ref. 1, Table 2-7)*		100		**10**
Targets					
7.	Nearest Well *(Ref. 1, Sec. 3.3.1; Ref. 4, pp. 45-55)*		50	20	
8.	Population:				
	8a.	Level I Concentrations	**	0	
	8b.	Level II Concentrations *(Ref. 1, Sec.3.3.2.3; Ref. 4, pp. 45-55, 58)*	**	0	
	8c.	Potential Contamination *(Ref. 1, 3.3.2.4, Table 3-12; Ref. 4, pp. 56-61)*	**	502.5	
	8d.	Population (Lines 8a + 8b + 8c)	**	502.5	
9.	Resources *(Ref. 1, Sec. 3.3.3; Ref. 4, p. 62)*		5	5	
10.	Wellhead Protection Area *(Ref. 1, Sec. 3.3.4; Ref. 4, p. 63)*		20	0	
11.	Targets (Lines 7 + 8d + 9 + 10)		**		**525.5**
Ground Water Migration Score for an Aquifer					
12.	Aquifer Score				
	((Lines 3 x 6 x 11)/82,500)***		100		**27.39**
Ground Water Migration Pathway Score					

Pathway Score (S_{gw}), (Highest value from Line 12 for all aquifers evaluated)***	100	**27.39**

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

			Maximum Value	Value Assigned	
Factor Categories and Factors					
DRINKING WATER THREAT					
Drinking Water Threat Score					
1.	Observed Release *(Ref. 1, Sec. 4.1.2.1.1, Ref. 4, pp. 69-73)*		550	550	
2.	Potential to Release by Overland Flow:				
	2a.	Containment	10	NS	
	2b.	Runoff	25	NS	
	2c.	Distance to Surface Water	25	NS	
	2d.	Potential to Release by Overland Flow (Lines 2a x (2b + 2c))	500	NS	
3.	Potential to Release by Flood:				
	3a.	Containment (Flood)	10	NS	
	3b.	Flood Frequency	50	NS	
	3c.	Potential to Release by Flood (Lines 3a x 3b)	500	NS	
4.	Potential to Release (Lines 2d + 3c, subject to a maximum of 500)		500	NS	
5.	Likelihood to Release (Higher of Lines 1 and 4)		550		550
Waste Characteristics					
6.	Toxicity/Persistence		*	NS	
7.	Hazardous Waste Quantity		*	NS	
8.	Waste Characteristics		100		NS
Targets					
9.	Nearest Intake		50	NS	
10.	Population:				
	10a.	Level I Concentrations	**	NS	
	10b.	Level II Concentrations	**	NS	
	10c.	Potential Contamination	**	NS	
	10d.	Population (Lines 10a + 10b + 10c)	**	NS	
11.	Resources		5	NS	
12.	Targets (Lines 9 + 10d + 11)		**		NS
Drinking Water Threat Score					

13.	Drinking Water Threat Score ((Lines 5 x 8 x 12)/82,500, subject to a maximum of 100)	100	NS

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor Categories and Factors			Maximum Value	Value Assigned	
HUMAN FOOD CHAIN THREAT					
Likelihood of Release					
14.	Likelihood of Release (Same value as Line 3)		550		550
Waste Characteristics					
15.	Tox./Persistence/Bioaccum. *(Ref. 1, Sec. 4.1.3.2.1; Ref. 4, pp. 10- 13, 21-25, 33-36; Ref. 3, pp. B-1 - B-20)*		*	5×10^8	
16.	Hazardous Waste Quantity *(Ref. 4, p. 76, Table 9; Ref. 1, Sec. 2.4.2.2, Table 2-6)*		*	100	
17.	Waste Characteristics *(Ref. 1, Sec 4.1.2.2.3; Ref. 4, pp. 10-13, 21-25, 33-36; Ref. 3, pp. B-1 - B20)*		1,000		320
Targets					
18.	Food Chain Individual *(Ref. 1, Sec. 4.1.3.3.1; Ref. 4, pp. 77-78)*		50	20.0	
19.	Population:				
	19a.	Level I Concentrations *(Ref. 1, Sec. 4.1.3.3.2.1; Ref. 4, p. 78)*	**	0	
	19b.	Level II Concentration *(Ref. 1, Sec. 4.1.3.3.2.2; Ref. 4, p. 78)*	**	0	
	19c.	Potential Human Food Chain Contamination *(Ref. 1, Sec. 4.1.3.3.2.3; Ref. 2, pp. 236, 237; Ref. 4, pp. 78,79; Ref. 17; Ref. 18; Ref. 5; Ref. 19, Ref. 20,)*	**	0.0003	
	19d.	Population (Lines 19a + 19b + 19c) *(Ref. 1, Sec. 4.1.3.3.2.3)*	**	0.0003	
20.	Targets				
	(Value from Lines 18 + 19d)		**		20.0003
Human Food Chain Threat Score					
21.	Human Food Chain Threat Score ((Lines 14 x 17 x 20)/82,500 subject to a maximum of 100)		100		**42.67**

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor Categories and Factors			Maximum Value	Value Assigned
ENVIRONMENTAL THREAT				
Likelihood of Release				
22.		Likelihood of Release (Same Value as Line 3)	550	550
Waste Characteristics				
23.		Ecosystem Toxicity/Persistence/ Bioaccumulation *(Ref. 1, Sec. 4.1.4.2.1; Ref. 4, pp. 80,81)*	*	$5x10^8$
24.		Hazardous Waste Quantity *(Ref. 1, Sec. 4.1.4.2.2; Ref. 4, pp. 81-82, Table 17)*	*	100
25.		Waste Characteristics *(Ref. 1, Sec. 4.1.4.2.3; Ref. 4, p. 81, Table 16)*	1,000	320
Targets				
26.		Sensitive Environment:		
	26a.	Level I Concentrations *(Ref.1, Sec. 4.1.4.3.1.1; Ref. 4, pp. 83, 84)*	**	0
	26b.	Level II Concentrations *(Ref.1, Sec. 4.1.4.3.1.2; Ref. 4, pp. 83, 84)*	**	0
	26c.	Potential Contamination *(Ref. 1, Sec. 4.1.4.3.1.3; Ref. 4, pp. 83, 84)*	**	NS
	26d.	Sensitive Environments *(Ref. 1, Sec. 4.1.4.3.1; Ref. 4, pp. 83, 84)*		
		(Lines 26a + 26b + 26c)	**	NS
27.		Targets (Value from Line 26d)	**	NS
Environmental Threat Score				
28.		Environmental Threat Score		
		((Lines 22 x 25 x 27)/82,500, subject to a maximum of 60)	60	NS
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED				
29.		WATERSHED SCORE***		
		(Lines 13 + 21 + 28, subject to a maximum of 100)	100	**42.67**
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE				
30.		Component Score (S_{of})*** (Highest score from Line 29 for all watersheds evaluated, subject to a maximum of 100)	100	**42.67**